

AMENDMENT TO THE DRAWING

Replacement sheet is provided for FIGs. 3 and 4 pursuant to the objection raised by the office action on pages 2-3.

REMARKS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1, 3-5, 7-13 are presently pending in this application, Claims 2 and 6 having been canceled without prejudice or disclaimer, Claims 1 and 3-5 having been amended, and Claim 13 having been added by the present amendment, Claims 7-12 having been withdrawn from further consideration as directed to a non-elected invention.

In the outstanding Office Action, the drawings were objected to as failing to comply with 37 CFR 1.84(p)(5); the disclosure and Claims 4-6 were objected to because of informalities; Claims 2 and 4-6 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention; and Claims 1-6 were rejected under 35 U.S.C. 102(b) as being clearly anticipated by Oka et al. (US 2001/0006000 A1).

In response to the objection to the drawings, submitted herewith is a separate LETTTER REQUESTING APPROVAL OF DRAWING CHANGES, submitting for approval corrections to Figs. 3 and 4 to add reference numeral 33. Accordingly, the drawings are believed to be in compliance with the requirements in 37 CFR 1.84(p)(5).

In response to the objection to the disclosure, the specification has been amended to correct the noted informalities. No new matter has been introduced. Accordingly, no further objection on that basis is anticipated.

In response to the objection to Claims 4-6, Claims 4 and 5 have been amended to correct the noted informalities and Claim 6 has been canceled. Therefore, no further objection on that basis is anticipated.

In response to the rejection of Claims 2 and 4-6 under 35 U.S.C. 112, second paragraph, Claims 4 and 5 have been amended to recite the claimed subject matter in definite terms. Accordingly, Claims 4 and 5 are now believed to be in full compliance with the requirements of 35 U.S.C. 112, second paragraph. Claims 2 and 6 have been canceled. If, however, the Examiner disagrees, the Examiner is invited to telephone the undersigned who will be happy to work in a joint effort to derive mutually satisfactory claim language.

Amended Claims 1 and 3-5 and new Claim 13 are fully supported by the specification, drawings and claims as originally filled. Hence, no new matter is believed to be added thereby.

Briefly recapitulating, Claim 1 is directed to a method for forging a hollow rack bar from a blank pipe made of metal. For example, referring to the non-limited embodiment of Figs. 1A to 1E, the blank pipe 10 is subjected to a plastic deformation process for an adjustment of an inner diameter and an outer diameter of the blank pipe 10 along an entire periphery of the blank pipe 10. Referring to the non-limited embodiment of Figs. 1C to 1E and 2B, a predetermined outer part of the blank pipe 10 is subjected to a flattening process to substantially flatten the predetermined outer part. Referring to the non-limited embodiment of Fig. 3, the blank pipe after the plastic deformation process and the flattening process is held by a die 20 having a toothed portion 28-1 so that the toothed portion 28-1 is contacted with the predetermined outer part of the blank pipe. Referring to the non-limited embodiment of Figs. 3, 4, 5A and 5B, a mandrel 40 is inserted into the blank pipe 10 held by the die 20 for causing the metal to be flown toward the toothed portion 28-1, thereby forming on the predetermined outer part of the blank pipe another toothed portion having a shape corresponding to a shape of the toothed portion of the die. idealized measurement.

The Office Action asserts that Oka et al. disclose the present invention. However, Applicant notes that a claim is anticipated only if each and every element as set forth in the

claims is found, either expressly or inherently described, in a single prior art reference.

Verdegaal Bros. v. Union Oil Co. of Californial, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). As will be demonstrated below, Oka et al. clearly do not meet each and every limitation of Claim 1.

The Office Action asserts Oka et al. disclose a method for forging a hollow rack bar from a metal blank pipe 3, including (a) subjecting the blank pipe to a plastic deformation process (paragraph [0015]) for an adjustment of a cross-sectional shape of the metal blank pipe; (b) holding said adjusted metal blank pipe by a die having toothed portions so that the toothed portions are contacted with the blank pipe at its outer surface (paragraph [0016]); and (c) inserting, under a pressure, a mandrel 12 into the blank pipe 3 held by the die 5, 6, 11 for causing the metal to be flown toward toothed portions, thereby forming on the outer surface of the blank pipe toothed portions having shapes corresponding to those of the toothed portions of the die.¹

However, Oka et al. fail to disclose subjecting the blank pipe to a plastic deformation process for an adjustment of an inner diameter and an outer diameter of the blank pipe along an **entire** periphery of the blank pipe.

Although Oka et al. disclose that a portion of the periphery of the blank pipe 3 is subjected to a flattening process to substantially flatten the predetermined outer part (paragraph [0015]), Oka et al. fail to disclose subjecting the blank pipe to a plastic deformation process for an adjustment of an inner diameter and an outer diameter of the blank pipe along an entire periphery of the blank pipe. Instead, the paragraph [0015] of Oka et al. disclose the step (b) of subjecting a predetermined outer part of the blank pipe to a flattening process to substantially flatten the predetermined outer part as recited in Claim 1, but not the step (a) of subjecting the blank pipe to

¹ See the outstanding Office Action, page 5, line 6 from the bottom to page 6, line 5.

a plastic deformation process for an adjustment of an inner diameter and an outer diameter of the blank pipe along an entire periphery of the blank pipe.

Accordingly, Oka et al. are not believed in any way to anticipate the specific features recited in Claim 1. Therefore, Claim 1 is believed to be allowable.

Likewise, independent Claim 5 includes features substantially similar to what is recited in Claim 1 to the extent discussed above. Thus, Claim 5 is also distinguishable from Oka et al. Therefore, Claim 5 is believed to be allowable.

Dependent Claim 3 depends directly from Claim 1. Accordingly, substantially the same arguments as set forth above with regard to Claim 1 also apply to dependent Claim 3. Hence, dependent Claim 3 is also believed to be allowable.

Briefly recapitulating, Claim 4 is directed to a method for forging a hollow rack bar from a blank pipe made of metal. The method includes a pre-forming step and a main forming step after the execution of the pre-forming step. For example, the pre-forming step includes (a) subjecting the blank pipe to a swaging process, (b) clamping the swaged blank pipe, and (c) withdrawing the working core. In the pre-forming step, referring to the non-limited embodiment of Figs. 1A and 1B, the blank pipe is subjected to a swaging process for reducing an outer diameter of the blank pipe. Referring to the non-limited embodiment of Fig. 1C, the swaged blank pipe is clamped by a clamping die of a desired shape at an outer periphery thereof, while locating a working core 14 inside the blank pipe. Referring to the non-limited embodiment of Fig. 1D and 1E, the working core is withdrawn to **expand** the blank pipe in order to generate a desired shape of a hollow cavity of the blank pipe expanding in an axial direction and a radial direction.

The main forming step includes (d) holding the pre-formed blank pipe and (e) inserting a mandrel. In the main forming step, referring to the non-limited embodiment of Fig. 3, the pre-

formed blank pipe is held from its outer side by a rack forming die having a toothed portion. Referring to the non-limited embodiment of Fig. 3, 4, 5A and 5B, mandrel is inserted to the hollow cavity of the blank pipe, thereby forming on an outer surface of the blank pipe another toothed portion having a shape corresponding to a shape of the toothed portion of the rack forming die.

The Office Action asserts that Oka et al. disclose the present invention recited in Claim 4.² However, Oka et al. fail to disclose withdrawing the working core to expand the blank pipe in order to generate a desired shape of a hollow cavity of the blank pipe expanding in an axial direction and a radial direction.

Although Oka et al. disclose providing a core bar 10 in the tube 3, the core bar 10 is for receiving the punch 9,³ but not for expanding the blank pipe in order to generate a desired shape of a hollow cavity of the blank pipe expanding in an axial direction and a radial direction.

Accordingly, Oka et al. are not believed in any way to anticipate the specific features recited in Claim 4. Therefore, Claim 4 is believed to be allowable.

Dependent Claim 13 depends directly from Claim 4. Accordingly, substantially the same arguments as set forth above with regard to Claim 4 also apply to dependent Claim 13. Hence, dependent Claim 13 is also believed to be allowable.

² See the outstanding Office Action, page 6, line 11 to page 7, line 3.

³ See Oka et al., paragraph [0015].

Consequently, in view of the present amendment, it is respectfully submitted that this application is in condition for allowance and an early and favorable action to that effect is respectfully requested.

Respectfully Submitted,

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